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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,256	09/22/2005	Donald Edwin Hargraves	2974/2US	1625
23638 7590 07/24/2008 ADAMS INTELLECTUAL PROPERTY LAW, P.A. Suite 2350 Charlotte Plaza 201 South College Street CHARLOTTE, NC 28244				
EXAMINER KIM, JOHN K				
ART UNIT 2834		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/550,256

**Applicant(s)**

HARGRAVES ET AL.

**Examiner**

JOHN K. KIM

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7, 13-17 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 13-17 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB08)
- Paper No(s)/Mail Date 7/11/2007
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1, 7, 13 and 19 are objected to because of the following informalities: Claim 7 is said dependent of claim 6 but claim 6 has been cancelled. For purpose of examination, claim 7 is considered being dependent to claim 1. Claim 19 is said dependent of claim 18 but claim 18 has been cancelled. For purpose of examination, claim 19 is considered being dependent to claim 13. Consider Claims 1 and 13, the claims recite "... wherein said first inner and outer races are secured to said shaft, and said second inner and outer races are secured to said housing", but none of embodiments or figures shows such configuration. Furthermore, if it is configured so, rotor can not rotate. For purpose of examination, claims are interpreted as "... wherein said first inner and second inner races are secured to said shaft, and said first outer races and second outer races are secured to said housing". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1, 2, 5, 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Du (US 6838797).

As for claim 1, Fries teaches (in Fig. 1) an electrical machine, comprising: a housing assembly (4) having first (5) and second ends (14); a first bearing (8) mounted in said housing, said first bearing having a plurality of rolling elements disposed between first inner and outer races; a second bearing (15) mounted in said housing and spaced away from said first bearing (8), said second bearing having a plurality of rolling elements disposed between second inner and outer races; a rotor assembly (2) having first and second ends mounted in said first and second bearings (8, 15), respectively, such that said rotor has a predetermined amount of axial and radial play relative to said housing (inherent clearance for manufacturing); and a biasing element (10) disposed between one of said rotor assembly (2) or said housing and one of said bearings (8), said biasing element (10) urging said rotor assembly to a preloaded position which eliminates said axial and radial play, wherein said first inner and second inner races are secured to said

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shaft (1), and said first outer races and second outer races are secured to said housing (12, at 14), such that said rotor assembly is retained in said preloaded position. Fries however failed to clearly teach wherein the coefficients of thermal expansion of said housing assembly, said bearings, and said rotor are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40o C to about 105o C. In the same field of endeavor, Du teaches motor temperature should be designed below 140 degree C. (col. 1, line 1-40) which includes the disclosed operating range -40 ~ 105 degree C. Furthermore, it is well known for those skilled in the art that typical commercial motor is ruled under class B insulation by UL and the maximum temperature for approval test in this case is 105 degree C, and for magnet, especially for ferrite family magnet, the lower allowable temperature is -40 degree C or higher depending on the thickness of the magnet, and it is due to demagnetization region. If such magnet is exposed below that temperature, the magnet is losing the power permanently. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Du with that of Fries for optimum range of the operation.

As for claim 2, Fries and Du teach the claimed invention as applied to claim 1 above. Fries further teaches (in Fig. 1) said first and second outer races are secured to said housing (12, 14), and said first and second inner races are secured to said shaft (1).

As for claim 5, Fries and Du teach the claimed invention as applied to claim 1 above. Fries further teaches (in Fig. 1) said housing assembly (4) comprises: a generally cylindrical housing including an axially extending portion (4) with a front end plate (5)

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connected to a front end thereof; and an end bell (14) attached to a rear end of said housing.

As for claim 13, Fries teaches (in Fig. 1) an electric motor, comprising: a generally cylindrical housing assembly (4) having first (5) and second ends (14), said housing defining first and second spaced-apart bearing pockets (12 and at 14); a first bearing (8) having a plurality of rolling elements disposed between first inner and outer races, said first outer race being received in said first bearing pocket (12); a second bearing (15) having a plurality of rolling elements disposed between second inner and outer races, said second outer race being received in said second bearing pocket (at 14); a rotor assembly (2) including a shaft (1) received in said first and second inner races, such that said rotor (2) has a predetermined amount of axial and radial play relative to said housing (4); and a biasing element (10) disposed between one of said rotor assembly (2) or said housing and one of said bearings (8) which urges said rotor assembly to a preloaded position which eliminates said axial and radial play, wherein said first inner and second inner races are secured to said shaft (1), and said first outer races and second outer races are secured to said housing (12, at 14), such that said rotor assembly is retained in said preloaded position. Fries however failed to clearly teach wherein the coefficients of thermal expansion of said housing assembly, said bearings, and said rotor are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40o C to about 105o C. In the same field of endeavor, Du teaches motor temperature should be designed below 140 degree C. (col. 1, line 1-40) which includes the disclosed operating range -40 ~ 105 degree C. Furthermore, it is well known for those skilled in the art that typical commercial motor is ruled under class B

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insulation by UL and the maximum temperature for approval test in this case is 105 degree C, and for magnet, especially for ferrite family magnet, the lower allowable temperature is -40 degree C or higher depending on the thickness of the magnet, And it is due to demagnetization region. if the magnet is exposed below that temperature, the magnet is loosing the power permanently. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Du with that of Fries for optimum range of the operation.

As for claim 14, except claim dependency, claim 14 contains the same limitation as claim 2 and is rejected for the same reason set forth in connection with the rejection of claim 2 above.

As for claim 17, except claim dependency, claim 17 contains the same limitation as claim 5 and is rejected for the same reason set forth in connection with the rejection of claim 5 above.

5. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Du (US 6838797) and in further view of Otsuka (US 6023113).

As for claim 3, Fries and Du teach the claimed invention as applied to claim 1 above. Fries, however, failed to teach or suggest biasing element comprises a spring disposed between rotor assembly and said first or second inner race. In the same field of endeavor, Otsuka teaches (in Fig. 1) biasing element comprises a spring (7) disposed between rotor assembly (6) and first or second inner race (of 3). Therefore, it would have

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been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Otsuka with those of Fries and Du for protection of spring by having the spring rotates with shaft.

As for claim 15, except claim dependency, claim 15 contains the same limitation as claim 3 and is rejected for the same reason set forth in connection with the rejection of claim 3 above.

6. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Du (US 6838797) and in further view of Shiga et al (US 6930430).

As for claim 4, Fries and Du teach the claimed invention as applied to claim 1 above. Fries, however, failed to teach or suggest said biasing element comprises a spring (10) disposed between said housing and said first or second outer race. In the same field of endeavor, Shiga teaches (in Fig. 1) biasing element comprises a spring (71) disposed between housing (12) and said first or second outer race (of 40). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Shiga with those of Fries and Du for protection of spring by having the spring does not rotate with shaft.

As for claim 16, except claim dependency, claim 16 contains the same limitation as claim 4 and is rejected for the same reason set forth in connection with the rejection of claim 4 above.



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7. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Du (US 6838797) and Noguchi et al (US 5639168) and in further view of Johnatakis et al (US 5134328), Nishimura (US 6495941) and Kan et al (US 6528909).

As for claim 7, Fries and Du teach the claimed invention as applied to claim 1 above. Fries however failed to teach said bearings are constructed from high carbon chromium steel and said housing assembly and said rotor assembly are constructed from 400 series stainless steel. In the same field of endeavor, Noguchi teaches (in Fig. 1) bearings are constructed from high carbon chromium steel. (Col. 8, line 55-57) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Noguchi with that of Fries for high speed drive. Noguchi however failed to teach housing assembly and rotor assembly are constructed from 400 series stainless steel. In the same field of endeavor, Johnatakis et al (US 5134328) and Nishimura (US 6495941) teach housing assembly and rotor assembly are constructed from stainless steel, respectively. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Johnatakis and Nishimura with those of Fries, Du and Noguchi for moisture resistive. Johnatakis and Nishimura however failed to teach the stainless steel is 400 series SUS steel. In the same field of invention, Kan teaches use of 400 series stainless steel in the motor assembly. (col. 7, line 40-55) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Kan with those of Fries, Du, Noguchi, Johnatakis and Nishimura for harness enhancement.

As for claim 19, except claim dependency, claim 19 contains the same limitation as claim 7 and is rejected for the same reason set forth in connection with the rejection of claim 7 above.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Following references are not used for above office action but it will be useful for teaching of the invention disclosed. Paillet (US 4471246), Fritchman (US 4632644) and Kuwako et al (US 3936680) show a grooved rotor to insert a spring. As shown in Fritchman, grooved rotor has been traditionally used in refrigerator compressor using a single phase induction motor. Motors in Paillet and Kuwako are permanent magnet motor same as the disclosed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN K. KIM whose telephone number is (571)270-5072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-270-6072.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business

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Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK

/Darren Schuberg/  
Supervisory Patent Examiner, Art Unit 2834